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# CANADIAN PATENT

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COMESTIBLE CONTAINING MAGNESIUM ION

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Bad breath is effectively counteracted by a comestible  
containing at least about one part by weight of magnesium  
ion per 1000 parts by weight of product.

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BREATH DEODORIZER

Bad breath due to mouth odors is generally attributed to stale or putrified saliva. The cause or causes of this phenomenon are poorly or inadequately understood. The phenomenon, however, is widely prevalent and embarrassing to those afflicted and offensive to others.

It is an object of the present invention to provide means for counteracting bad breath. Another object is to provide comestibles which are effective in counteracting bad breath. These and other objects of the present invention will be apparent from the following description.

It has now been found that bad breath due to mouth odor is effectively inhibited by the incorporation into a



comestible of at least about one part by weight of magnesium ion per 1000 parts by weight of product. The magnesium ion may be provided in the form of an inorganic or organic magnesium salt. The comestible may be, for example, a mint, a drop, a mouth wash, or a dental cream.

10 While the mechanism whereby magnesium ion works to inhibit bad breath is not understood, it has been found that the incorporation into a comestible of at least one part by weight of magnesium ion per 1000 parts by weight of product effectively inhibits bad breath. While amounts greater than one part by weight of magnesium ion per 1000 parts by weight of product are effective, and may be employed, if desired, it has been found that amounts of magnesium ion greater than about ten parts by weight per 1000 parts by weight of product may cause taste or flavor problems in a comestible. Consequently, magnesium ion is generally employed according to the present invention in the range of about  
20 one to about ten parts by weight per 1000 parts by weight of the comestible.

The magnesium ion may be provided in the form of an inorganic salt, such as, for example, magnesium chloride, magnesium hydroxide, magnesium nitrate or magnesium sulfate, or in the form of an organic salt formed from magnesium ion and an organic anion such as, for example, magnesium acetate, magnesium gluconate, magnesium succinate, magnesium carbonate, magnesium citrate, or magnesium benzoate.

30 The effectiveness of magnesium ion in inhibiting bad breath has been shown by comparative tests wherein 10 ml of

stimulated saliva collected by chewing gum base were added to each of a series of 12 ml centrifuge tubes about 15 cm in length into the bottom of which a small cotton plug had previously been placed. The plug extended about 0.5 cm from the bottom tip of the tube. No magnesium salt was added to the control tube while 0.017 g of the following magnesium salts were added, respectively, to seven tubes: magnesium carbonate, magnesium chloride, magnesium hydroxide, magnesium nitrate, magnesium sulfate, magnesium acetate and magnesium gluconate. Each of the tubes was centrifuged for thirty minutes and the supernatant liquid decanted. The plug was removed from each tube, placed in a separate vial which was then sealed and incubated at body temperature for eight hours. The control tube developed a vile, putrified odor while those vials containing plugs to which a magnesium compound had been added were free of odor. It was also found that the extremely obnoxious odor of the control tubes could be removed by adding 0.017 g of a magnesium compound, mixing well with the cotton plug and incubating for a short period of time at 98°F. Replicates of this test confirmed the foregoing results.

The foregoing test was repeated except that 0.02 cc of concentrated garlic juice was added to the cotton plug prior to incubation. In all instances the garlic odor was drastically reduced, and in a few cases was completely eliminated. In other tests similar to the foregoing except that no saliva was present, the addition of the magnesium compound did not reduce or eliminate the garlic odor showing the necessity of both magnesium ion and saliva in the odor reducing system.

The mechanism of odor reduction according to the present invention is not understood. It has been found that some ammonia is evolved during the incubation although the significance of this factor is not known. It is also possible that an increased production of oxidase in the presence of oral bacteria and magnesium ion is responsible. Calcium salts are ineffective in reducing odor.

10 The following examples illustrate the present invention without, however, limiting the same thereto. The efficacy of the following compositions in counteracting bad breath was evaluated by an independent laboratory. Twenty-one subjects of both sexes ranging in age from 16 to 70 years were evaluated for intrinsic (stale saliva) and extrinsic (onion) breath odor at 0, 1, 10, 20, 30, 45, 60 and 75 minutes. The results of over 10,000 actual evaluations were that breath odors, both intrinsic and extrinsic, were significantly reduced over the 1 hour and 15 minute observation period as compared to no treatment.

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Example 1

A pressed mint is prepared from the following formulation:

Mint granulation	97.6%
Mg(OH) <sub>2</sub> (U.S.P.)	1.0%
Calcium stearate	1.0%
Flavoring oil	0.4%

Example 2

30 A boiled drop is prepared from the following formulation:

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Sugar	73.5%
Corn Syrup 43° Be	25.0%
MgCO <sub>3</sub> (U.S.P.)	1.0%
Flavor	0.5%

Example 3

A mouth wash is prepared from the following formulation:

Magnesium acetate	5.00 gm
Sodium chloride	8.00 gm
Sodium bicarbonate	2.50 gm
Glycerin	420.00 ml
Alcohol	300.00 ml
Menthol	0.24 gm
Thymol	0.24 gm
Methyl salicylate	0.70 ml
Cinnamon oil	0.50 ml
Eucalyptus oil	1.30 ml
Cudbear tincture	16.00 ml
Krameria tincture	8.00 ml
Purified talc	20.00 gm
Purified water	sufficient to make 1,000.00 ml.

Example 4

A dental cream is prepared having the following composition:

Precipitated calcium carbonate	44.0%
MgCO <sub>3</sub>	1.0%
Sodium lauryl sulfate	1.5%
Glycerin	15.0%
Sorbitol (70% solution)	15.0%
Saccharin (soluble)	0.1%
Methyl p-hydroxy benzoate	0.1%

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Na alginate 21	1.5%
Flavor	1.1%
Purified water	20.7%

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THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE  
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A mint containing at least about one part by weight of magnesium ion per 1000 parts by weight, the magnesium ion being derived from magnesium chloride, magnesium hydroxide, magnesium nitrate, magnesium sulfate, magnesium acetate, magnesium gluconate, magnesium succinate, magnesium carbonate, magnesium citrate or magnesium benzoate.
2. The mint according to claim 1 wherein the magnesium ion is present in an amount of from one to ten parts by weight per 1000 parts by weight.
3. The mint according to claim 1 comprising from 1 to 10 parts by weight of magnesium ion per 1000 parts by weight, mint granulation, calcium stearate and flavoring oil.

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